BIRD

INSTRUCTION book

model 8201

Instruction Book

TERMALINE Model 8201

Coaxial Load Resistor

MODEL 8201 TERMALINE COAXIAL LOAD RESISTOR

SECTION I - GENERAL DESCRIPTION

The Model 8201 RF Dummy Load is designed as a low-reflection and non-radiating termination for coaxial RF transmission lines, to assist in the tuning and maintenance of transmitting equipment within its rating.

Electrical specifications pertaining to the Model 8201 Load are as follows:

Characteristic Impedance	50 ohms, nominal.
Power Input	500 watts, continuous
Frequency Range	Dc to 2.5 GHz
VSWR	1.1 to 1.0, 0 to 1 GHz 1.25 to 1.0, 1 to 2.5 GHz
Input Connector	Female N Type (can be interchanged with any Bird "QC" Type Connector)
Weight	20 pounds (approx)
Coolant	Oil
Mounting	Horizontal only

The Model 8201 RF Load is a self-contained instrument. No additional material or outside power source is required. The load unit is rectangular in shape with transverse cooling fins spaced evenly along the entire length. Reinforced fins at the front and rear are bent 90° at the bottom to form mounting flanges. These flanges act as supports for free standing use, or as mounting brackets for fixed mounting. Mounting holes are provided for this purpose. The Female N Type input connector is located on the front face of the unit. This is of the special "Quick Change" design (see Replacement Parts Data, Section V).

The Load unit is filled with a specially selected dielectric coolant.

The Model 8201 is useful for the following purposes:

a. As a substitute antenna.
   (1) For tuning transmitters - under non-radiating conditions.
   (2) For making routine tests and adjustments

b. As a substitute for any circuit loading Element.

c. To measure, with a suitable indicating device, the power output of coaxially transmitted power within its rating.

SECTION II - THEORY OF OPERATION

The Model 8201 equipment consists essentially of a carbon film-on-ceramic resistor immersed in a dielectric coolant. The resistor, individually selected for its accuracy, is enclosed in a special exponentally tapered housing. This provides a linear reduction in surge impedance, directly proportional to the distance along the resistor. When surrounded by the dielectric coolant, the characteristic impedance is therefore 50 ohms at the front (connector end), 25 ohms at the mid-point to compensate for the resistance already passed over, and zero ohms at the rear where the resistor joins the housing, forming the return conductor of the coaxial circuit. This produces the uniform, practically reflectionless line termination over the stated frequencies of the load resistor.

The dielectric coolant, is chosen for its desirable dielectric properties and thermal characteristics. Cooling of the Model 8201 is accomplished by natural fluid and air convection. The dielectric coolant carries the electrically generated heat from the resistor to the walls of the cylindrical cooling tank. This tank is encased in a set of radiating fins constructed from heavy gauge aluminum alloy, which are firmly pressed on the cylinder. The heat from the dielectric oil is transferred to the surrounding air by radiating fins.

Expansion of the coolant with the rise in temperature is allowed for by means of a synthetic rubber diaphram (not visible) in the rear dome of the unit. The breather holes in the dome is visible. Do not probe inside with any pointed instrument, as diaphram may be punctured.

SECTION III - INSTALLATION

The Model 8201 Load Resistor should be operated in a horizontal position only. The Radiator has flanged feet at both ends, with a rubber bumper at each corner. The Load Resistor may be used free-standing on any convenient flat surface. If it is desired to fasten the load by means of its base mounting flanges, unscrew the four acorn nuts which retain the bumpers, and remove bumpers. This exposes four 9/32-inch holes on a 12-17/32 x 5-1/8 rectangle. Fasten with suitable 1/4-inch machine screws and nuts or #12 wood screws, keeping the major axis of the load horizontal. Do not tilt upwards at the connector end. Be sure that there is ample provision for air circulation--at least 6 inches of free space around and above the unit.

SECTION IV - MAINTENANCE

This equipment is rugged and simple, and requires only nominal routine care. Keep the radiator fins and faces dusted off and the dielectric parts free of dirt and grime. If the connector contacts or insulator faces should become dirty, wipe with a little dry solvent (Inhibisol,[1] trichlorethylene, etc) on a cotton swab stick. Exercise caution to avoid breathing fumes. If the Resistor Unit (8201-012 - RF Section Ass'y) needs to be changed, place the load on end, the input connector up. Position securely in a box or frame to hold the equipment stable. Then loosen and remove the #10-32 screw on the clamping band around the front face connector mounting disc. Remove clamping band and carefully lift the Resistor Unit straight up, allowing the oil to drip back into the tank. Inspect the o-ring unless it is in good condition. Install new Resistor by reversing the foregoing procedure. Be sure the o-ring is properly placed, and tighten the clamping screws securely. After putting the assembled load resistor in a horizontal position, inspect for oil leakage.

The resistor is held in its housing by mechanical means. When the three Tru-Arc rings are removed from the tail of the resistor housing, the resistor is freed at the back end and will plug in and out of the spring fingers inside the front of the assembly. It is not recommended that these resistors be changed by field personnel.

Do not probe inside dome at the rear of the unit with any pointed instrument. This could cause damage to the diaphragm and possible leakage. Turning of the clamping screw of the V-band without adequate preparation may cause coolant leakage.

The Model 8201 Load Resistor is factory filled to the proper level with dielectric oil at room temperature. Watch for possible coolant leakage. Small amounts of leakage will not impair the efficiency of the equipment, but more than 10% loss will produce unfavorable effects. If necessary to add coolant, use only oil obtained from Bird Electronic Corp. (Part #5-030). Do not use substitute fluids for this purpose. The characteristics of the coolant are very important with respect to RF impedance and power rating.

1. Carbon tet. replacement

SECTION V - REPLACEMENT PARTS DATA

1. Fittings

The Model 8201 Load Resistor is normally supplied with a Female N Type "QC" Connector, unless otherwise specified on order. This input jack mates with the standard Male N Plugs (such as Type UG-21E/U or Type UG-1185A/U) enabling the equipment to be directly coupled to RG-8A/U or RG-9B/U type cables. If desired, the "QC" connector may be easily changed to another type. Just remove the four #8-32 round head machine screws holding the connector flange to the face mounting disc of the load resistor. Then pull the connector straight out. (This does not disturb the oil seal in any way). A new connector is installed by reversing this process. A holder for one spare connector is located on the rear face of the unit.

ALTERNATE AVAILABLE QUICK-CHANGE CONNECTOR TYPES-WITH BIRD PART NUMBERS:

N-Female	4240-062	LC-Female	4240-031
N-Male	4240-063	LC-Male	4240-025
HN-Female	4240-268	LT-Female	4240-018
HN-Male	4240-278	LT-Male	4240-012
C-Female	4240-100	UHF-Female (SO-239)	4240-050
C-Male	4240-110	UHF-Male (PL-259)	4240-179
	7/8" EIA Air Line	4240-002	

Special Note - The alternative connectors listed above should not be used beyond the power and frequency limitations applicable to respective types.

2. List of Replaceable Parts

Part No.	Description	Qty.
8201-012	RF Section Assembly	1
8110-039	O-Ring, Seal RF Section	1
2430-015	Rubber Diaphragm	1
2430-148	Diaphragm Cover	1
2430-052-1	Radiator Assembly	1
2430-055	Clamping Band Assembly, with 10-32 x 1-1/2 Fil. Hd. Screw	2
5-030	Coolant	1 Gal.

Bird Electronic Corp.
Cleveland, Ohio

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